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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/020,951	12/19/2001	Masatoshi Fukuda	011724	8648

23850 7590 10/16/2003

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EXAMINER

LANDAU, MATTHEW C

ART UNIT	PAPER NUMBER
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2815

DATE MAILED: 10/16/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/020,951

Applicant(s)

FUKUDA ET AL.

Examiner

Matthew Landau

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 July 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4 and 7-20 is/are pending in the application.
- 4a) Of the above claim(s) 13-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4 and 7-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 December 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the rounded border portion between a side surface and a bottom surface of the cylindrical-shaped storage electrode (claims 7 and 8) must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1 and 9 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In regards to claim 1 and 9, it is unclear what is meant by “a rest portion”. What structural element does this limitation refer to?

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-4, 7, and 8 are rejected under 35 U.S.C. 102(b) as being anticipated by Yamada.

In regards to claim 1, Figure 1b of Yamada discloses a semiconductor device comprising: a capacitor formed above a semiconductor substrate 1 and including a cylindrical shaped storage electrode 10b having a cylindrical projection (column 4, lines 48-52), an edge of the cylindrical projection being located on an uppermost part of the cylindrical-shaped storage electrode, a capacitor dielectric film 11b formed on the storage electrode 10b, and a plate electrode 12 formed on the capacitor dielectric film 11b, the edge of the cylindrical projection being rounded and having a larger thickness than a thickness in a rest portion. Note that the edge of the cylindrical projection is the uppermost portion of 10b, directly above the top edge of element 9b.

In regards to claim 2, Figure 1b of Yamada discloses the cylindrical-shaped storage electrode 10b has a thickness gradually thickened toward to the edge of the cylindrical projection.

In regards to claims 3 and 4, Figure 1b of Yamada discloses a side surface of the cylindrical projection 10b is tilted and a circumferential length of the cylindrical projection is gradually increased toward the edge. As can be seen in Figure 1b, the circumferential length of the inner portion of the cylindrical projection (i.e., the portion between elements 9b) tilts outward

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and the thickness increases toward the upper edge. Therefore, it follows that the circumferential length increases toward the edge of the cylindrical projection.

In regards to claims 7 and 8, Figure 1b of Yamada discloses a border portion between a side surface and a bottom surface (the inner surfaces facing layer 11b) of the cylindrical-shaped storage electrode 10b is rounded.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 9-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada in view of Nam et al. (US Pat. 6,380,579 B1, hereinafter Nam).

In regards to claim 9 and 11, the difference between Yamada and the claimed invention is the storage electrode being formed of a metal film. Figure 4 of Ham discloses a capacitor with a storage electrode (33a,29a) formed of platinum (column 6, lines 53-55). In view of such teaching, it would have been obvious to the ordinary artisan at the time the invention was made to modify the invention of Yamada by forming the storage electrode from a metal film. The ordinary artisan would have been motivated to modify Yamada in the manner described above for the purpose using a conductive material that is resistant to oxidation.

In regards to claim 10 and 12, Figure 1b of Yamada discloses the cylindrical-shaped storage electrode 10b has a thickness gradually thickened toward to the edge of the cylindrical projection.

Response to Arguments

Applicant's arguments filed July 1, 2003 have been fully considered but they are not persuasive.

In response to Applicants argument that Yamada neither teaches nor suggests “a cylindrical-shaped storage electrode having a cylindrical projection, an edge of the cylindrical projection being located on an uppermost part of the cylindrical-shaped storage electrode”, and the edge of the cylindrical projection being rounded and having a larger thickness than a thickness in the rest portion”, Figure 1b of Yamada teaches the upper portion of the storage electrode (above the top of film 9b) is rounded. This portion is an edge and it is on the upper end of the cylinder (the uppermost part). Therefore it is considered that an edge of the cylindrical projection of the storage electrode 10b is located on the uppermost part of the storage electrode and it is rounded. Applicant maintains that the edge of the storage electrode 10b shown in Figure 1b of Yamada is located over interlayer insulation film 7a. As stated above, it is considered that the portion of electrode 10b directly above the top edge of region 9b is an edge. This edge is located at an uppermost part of the electrode, therefore it meets the claim limitations.

In response Applicant's arguments that “Nam et al. neither teaches nor suggests that the edge shape of the metal film can be reconstituted into rounded or thickened shaped by the heat treatment”, Nam is merely relied upon for the teaching of platinum used as a capacitor electrode.

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The 103 rejection set forth above is modifying the type of material used for the storage electrode 10b of Yamada. The rejection does attempt to modify the shape of the electrode of Nam et al. Furthermore, the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew C. Landau whose telephone number is (703) 305-4396.

The examiner can normally be reached from 8:30 AM - 5:30 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on (703) 308-2772. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306 for regular communications and (703) 872-9306 for After Final communications..

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Matthew C. Landau

Examiner

October 13, 2003


JEROME JACKSON
PRIMARY EXAMINER